



# **Armed Forces College of Medicine AFCM**



**Brainstem III**

**Midbrain**

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Yussef**

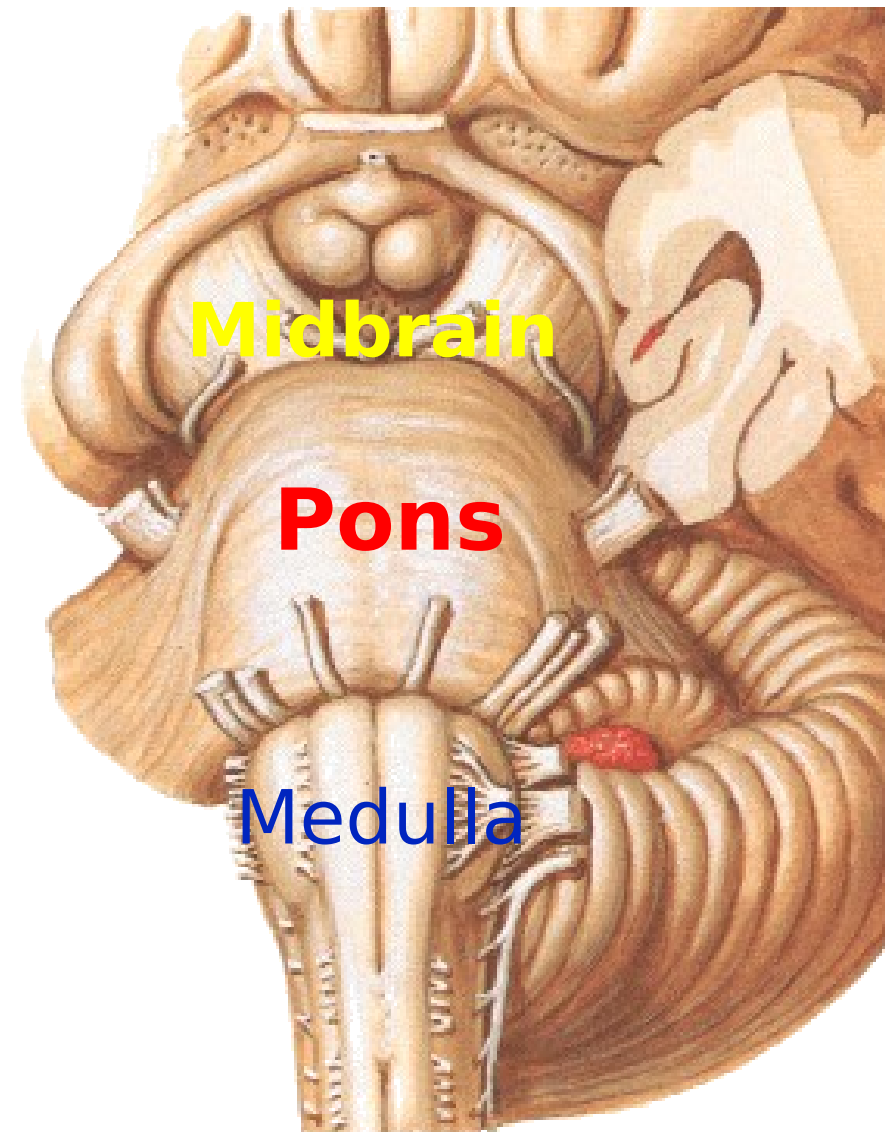
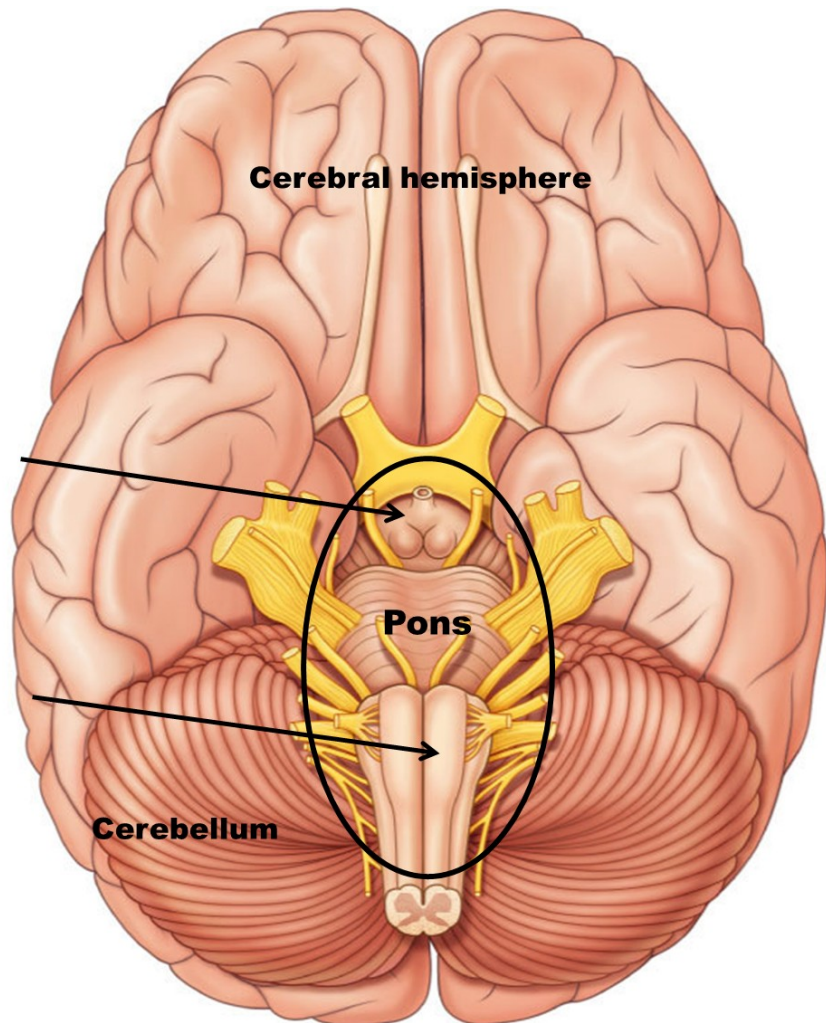
**Ass. Prof. Asmaa Abd  
Elmonem**

# INTENDED LEARNING OBJECTIVES (ILO)



By the end of this lecture the student will be able to:

- 1. Describe gross morphology of ventral and dorsal aspects of Midbrain**
- 2. Describe superficial attachments of cranial nerves.**
- 3. Describe the internal structure and correlated functions of different levels of Midbrain.**



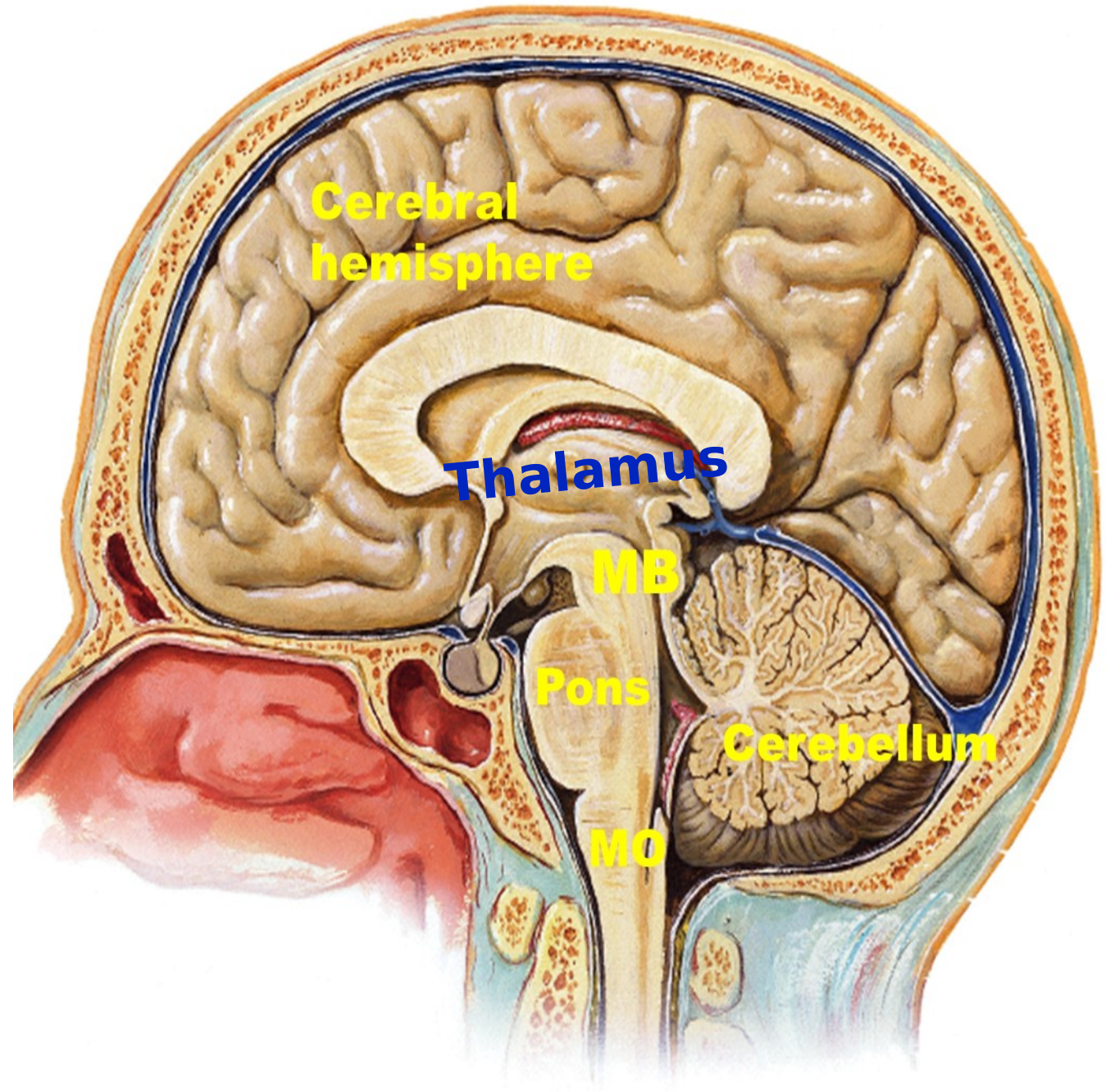
# Midbrain

# Midbrain

## Extension:

**Below: the upper border of pons**

**Above : thalamus**

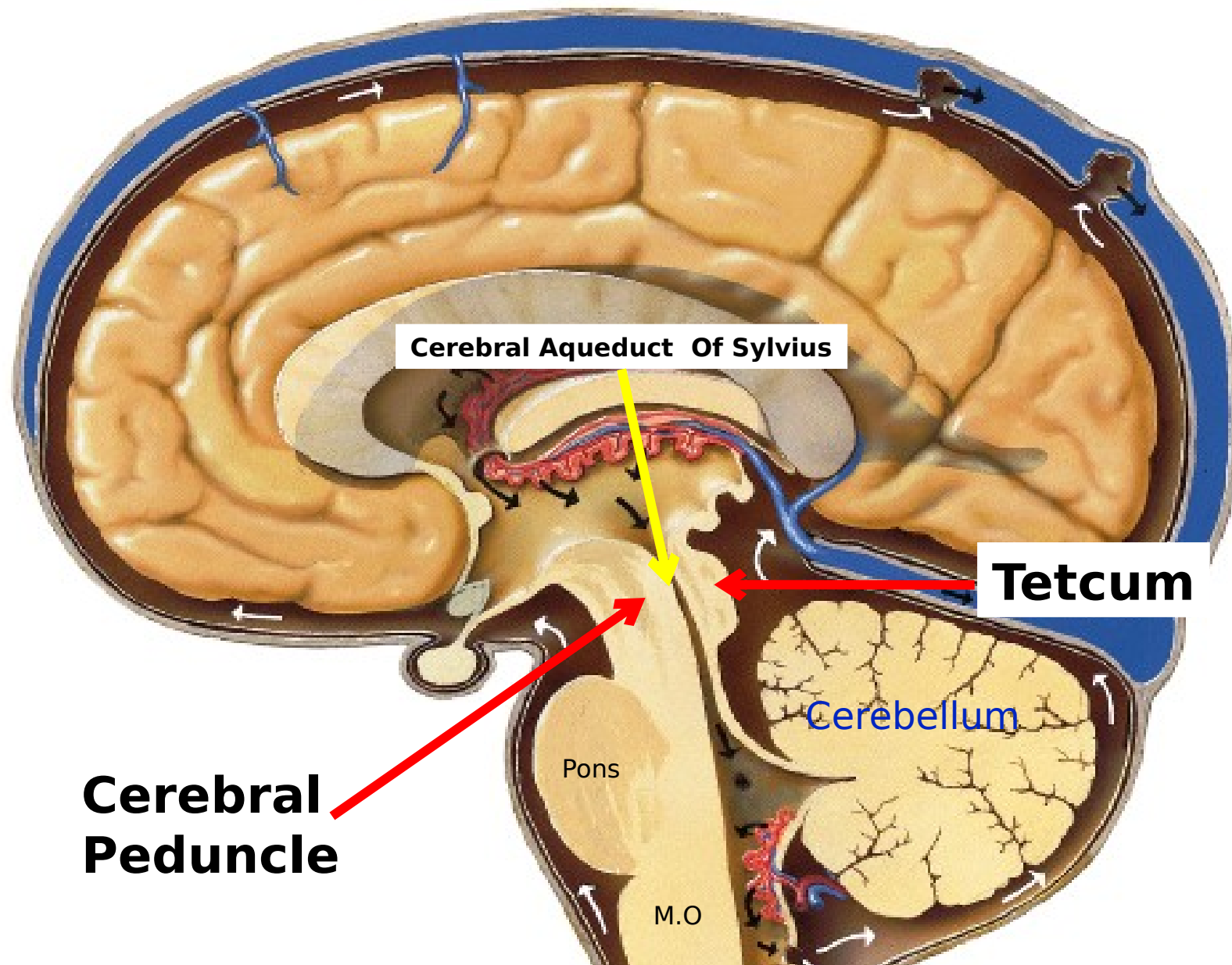


# Midbrain

**Cavity:**  
cerebral aqueduct of sylvius.

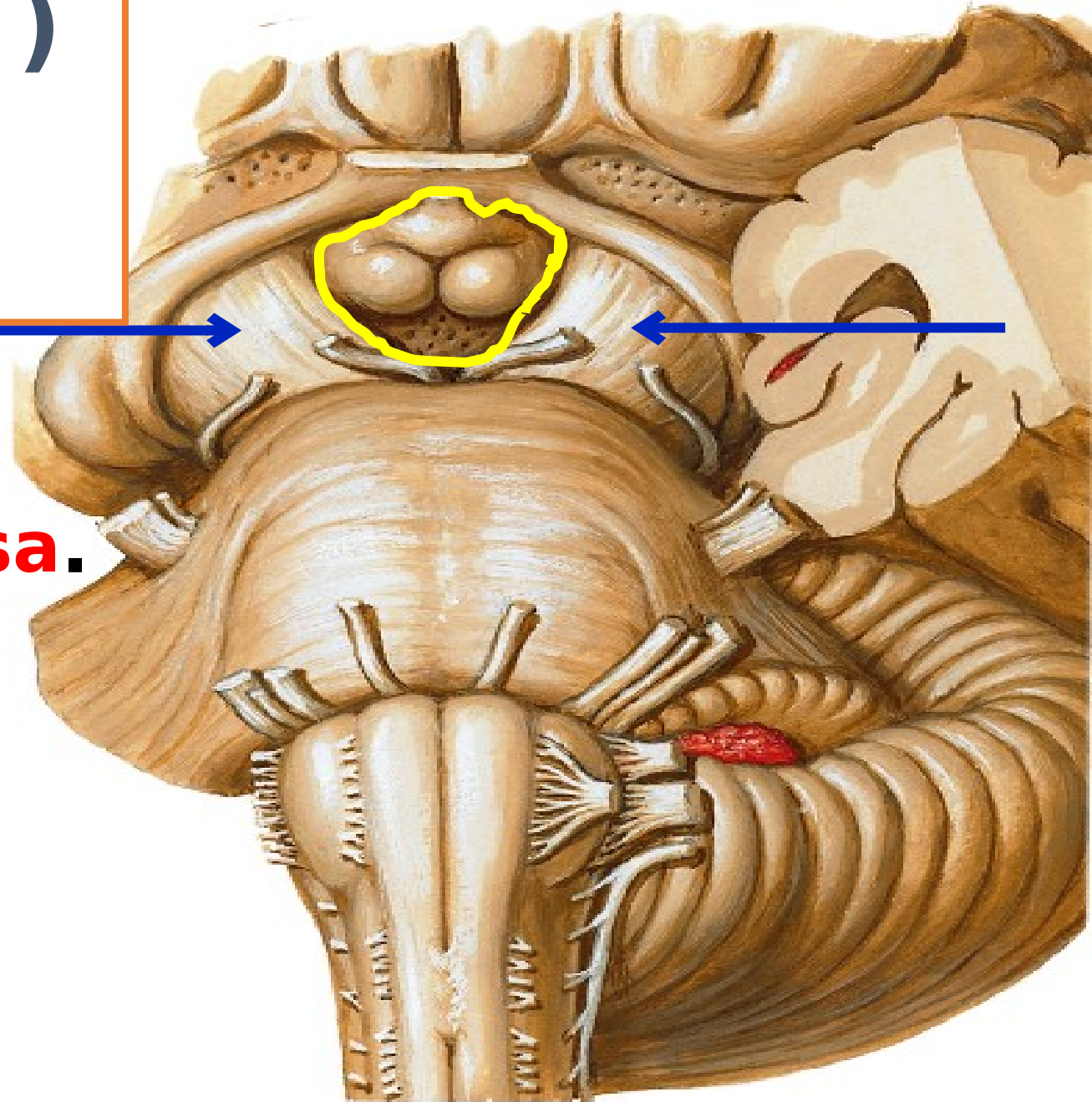
**Parts:**  
it is divided by its  
cavity into

- Cerebral Peduncle in front
- Tectum behind.



# Ventral (Anterior ) surface of Midbrain

peduncles  
enclosing **inter-  
peduncular fossa.**



# Interpeduncular Fossa

is a trapezoid depression between the 2 cerebral p  
It does not belong to the midbrain but to the hypo

## Boundaries:

1. Anteriorly: Chiasma

2. Laterally:

- Optic Tract
- Cerebral Peduncle.

3. Posteriorly: Pons.

Optic

## :Contents

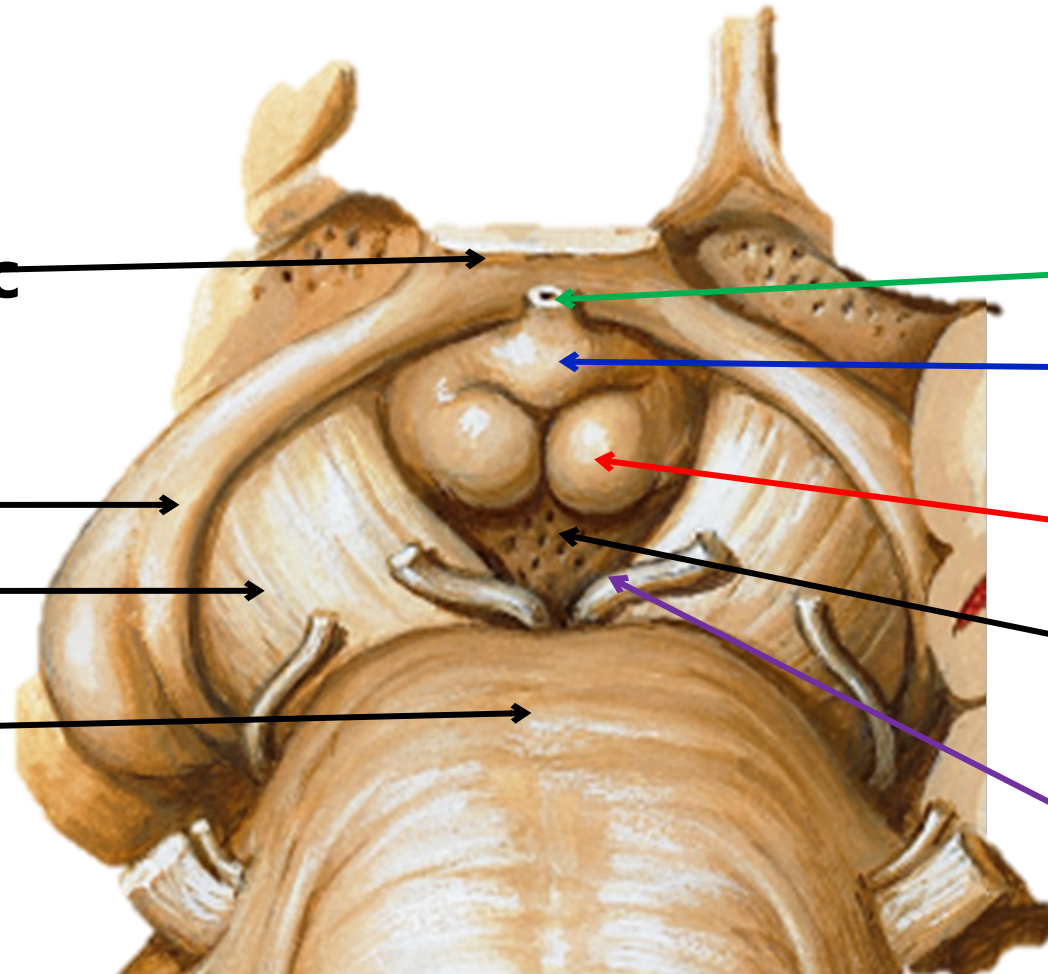
Infundibulum

Tuber cinereum

Mammillary bodies

Posterior perforated substance

Oculomotor nerve



# IDBRAIN

## Posterior aspect (Tectum)

### Two Superior colliculi (SC):

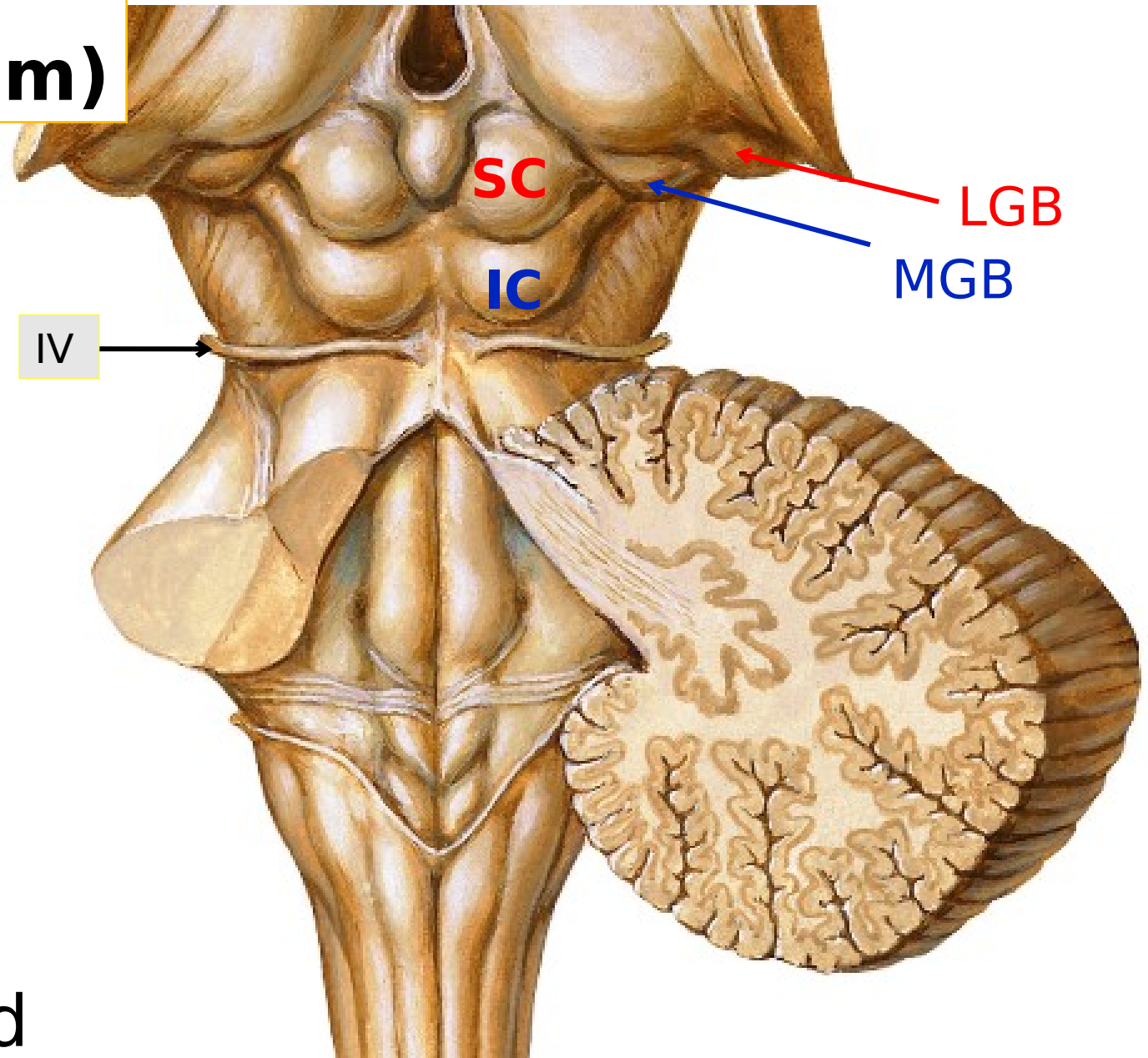
Are visual reflex centers.

Each one is

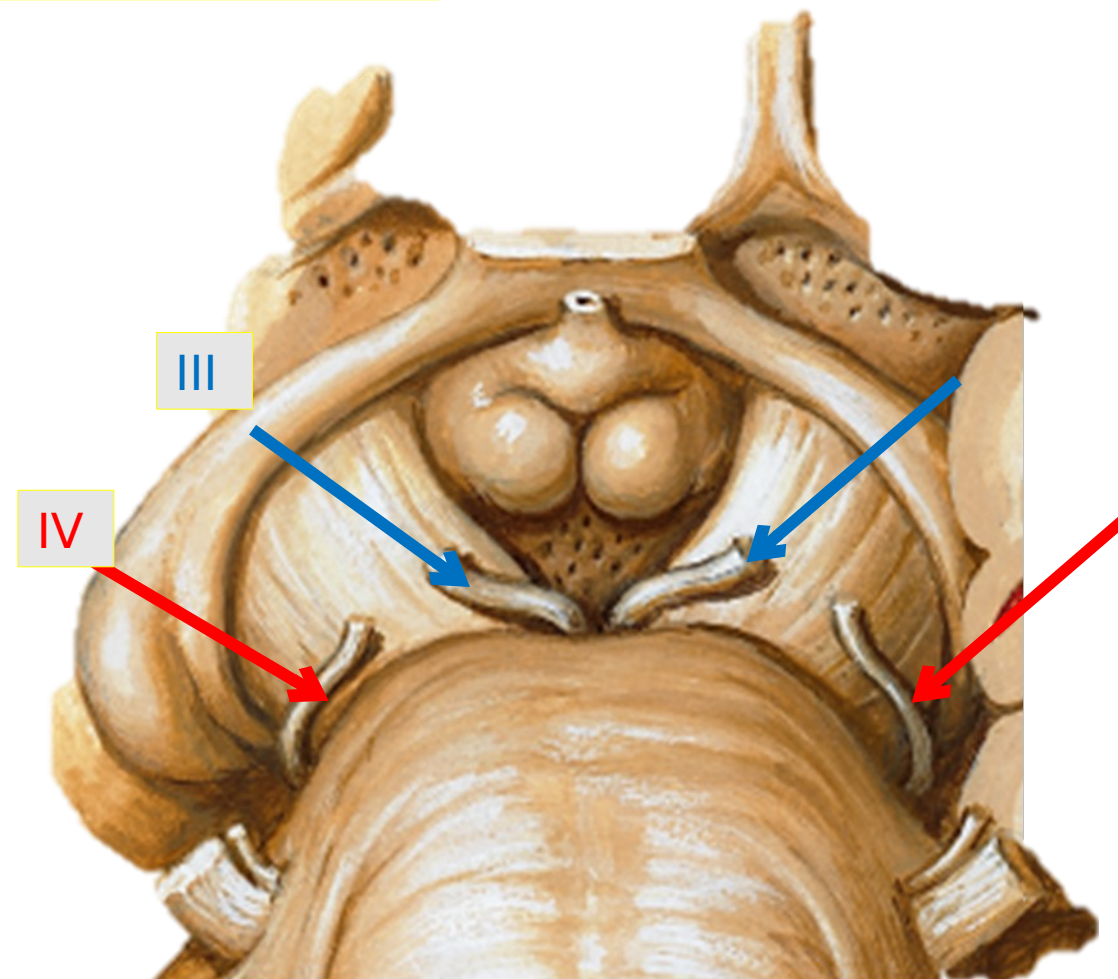
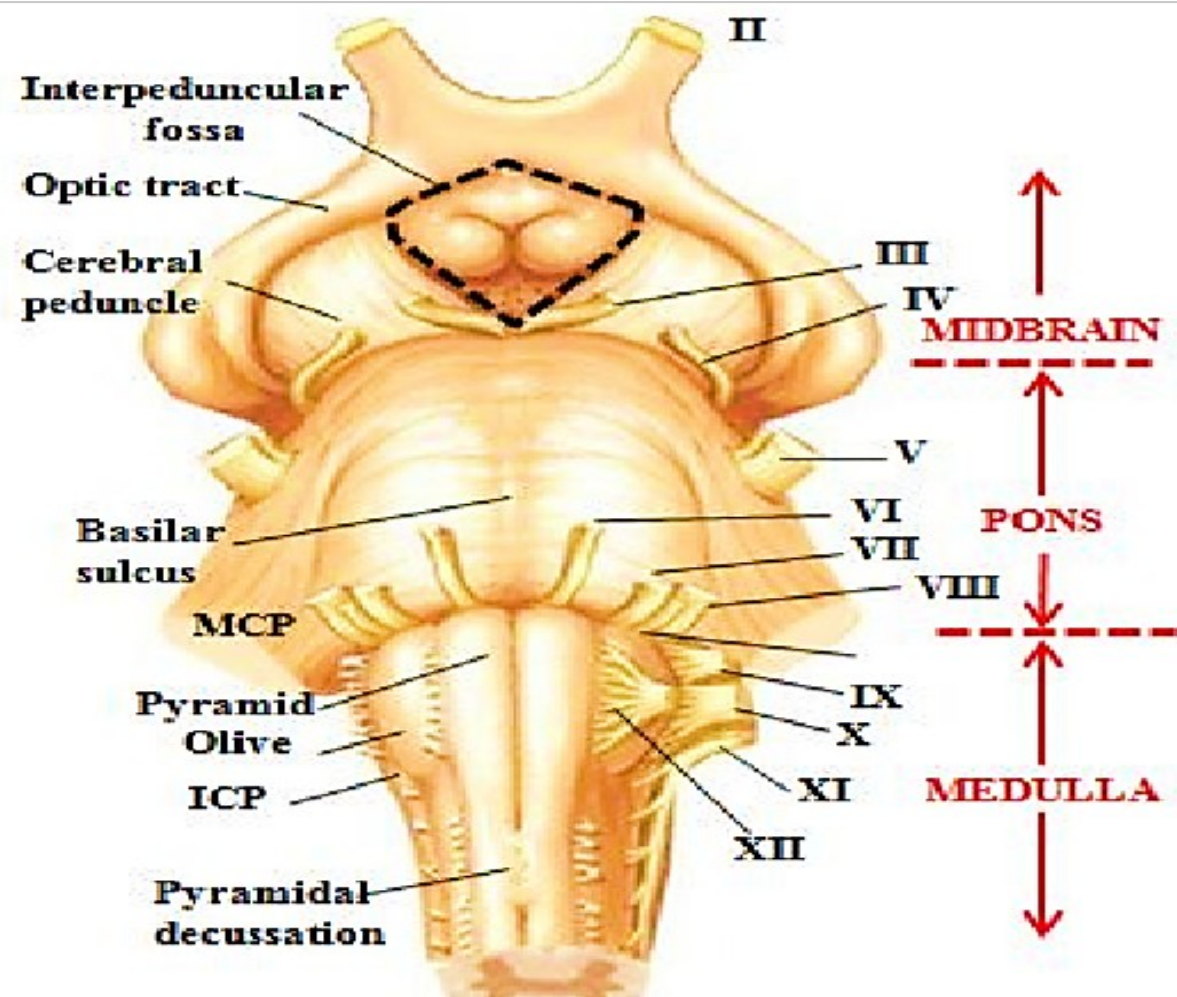
connected to  
Two Inferior lateral geniculate body (LGB):

Are auditory reflex centers.

Each one is connected



# Superficial attachments of cranial nerves

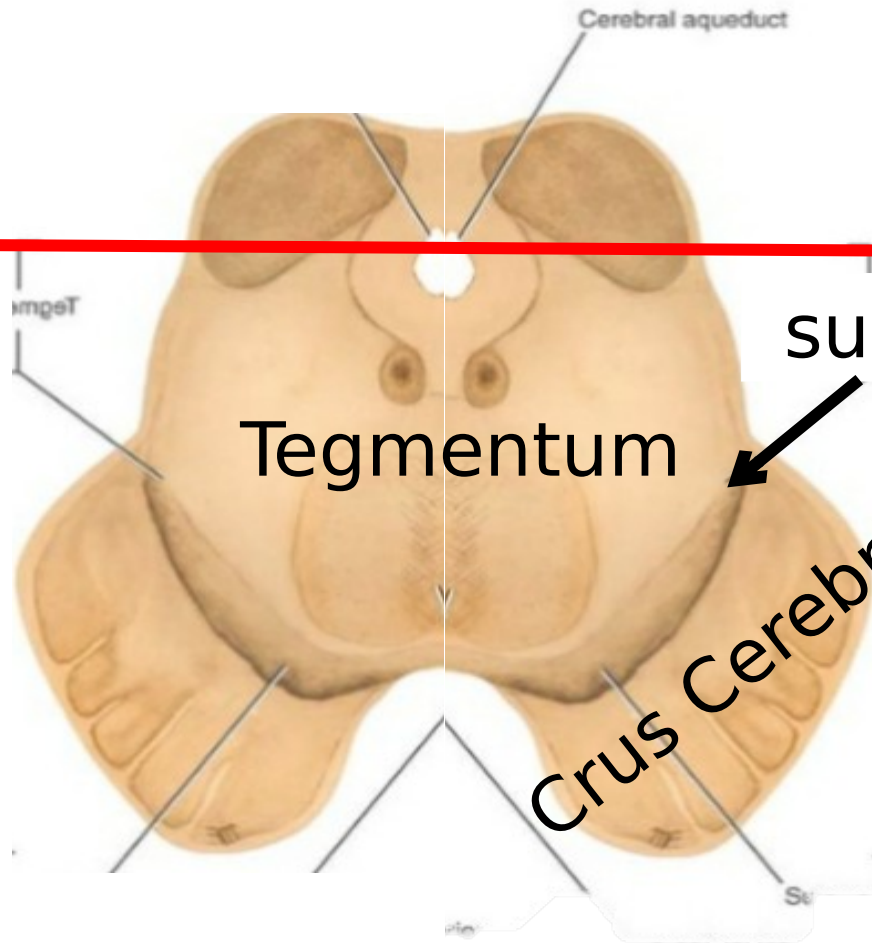


# Internal structure of mid

**TECTUM**

(dorsally)

**2 Cerebral Peduncles**  
(ventrally)



substantia nigra

Tegmentum

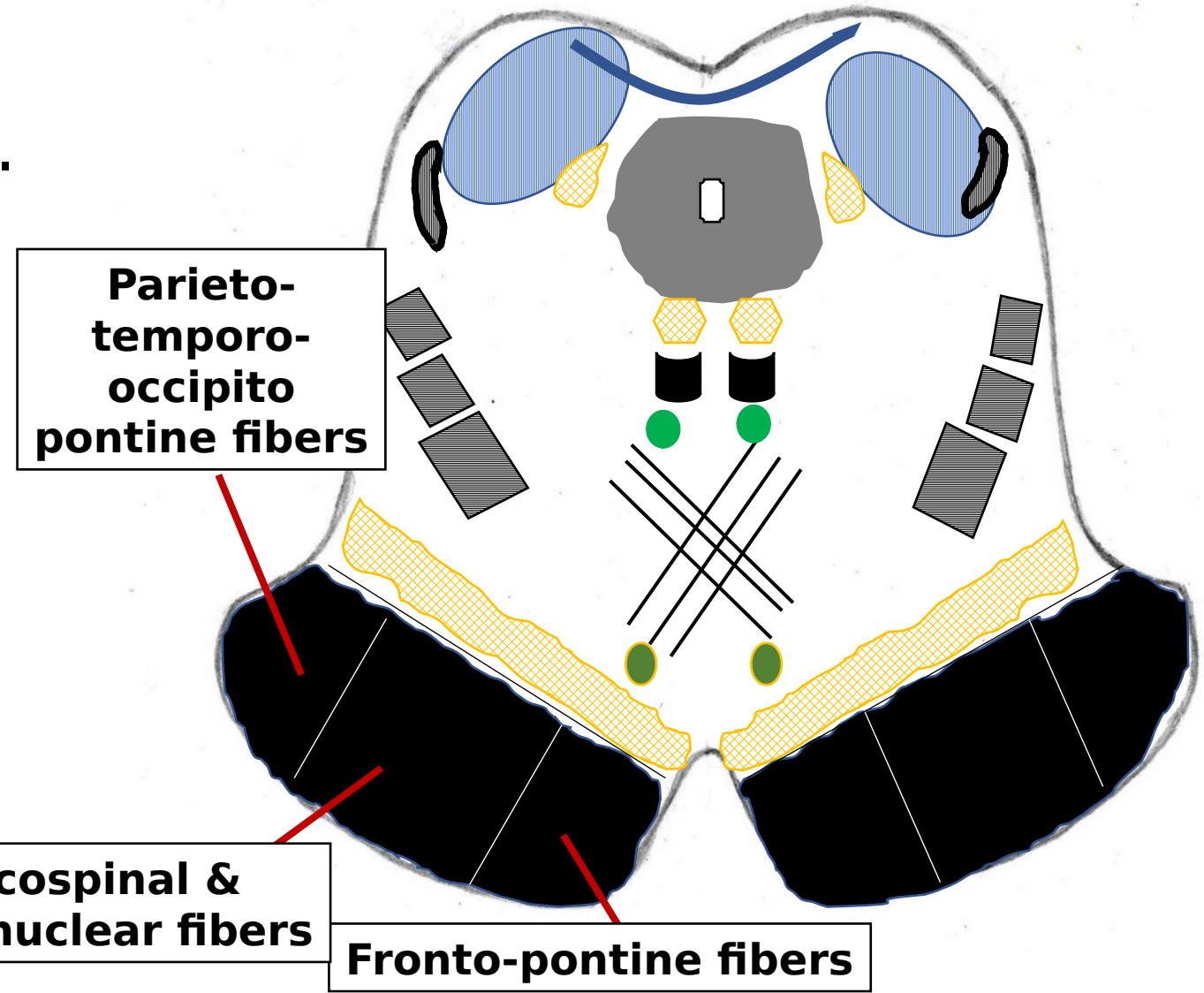
Crus cerebri

Tegmentum Crus cerebri

# Internal structure of midbrain

## Crus cerebri:

- Is the most anterior part.
- Contains descending fibers
- Arranged as follows:
  - **Medial 1/5:** fronto-pontine
  - **Lateral 1/5:** parieto-temporo- & occipito pontine
  - **Middle 3/5:** corticospinal & corticonuclear fibers



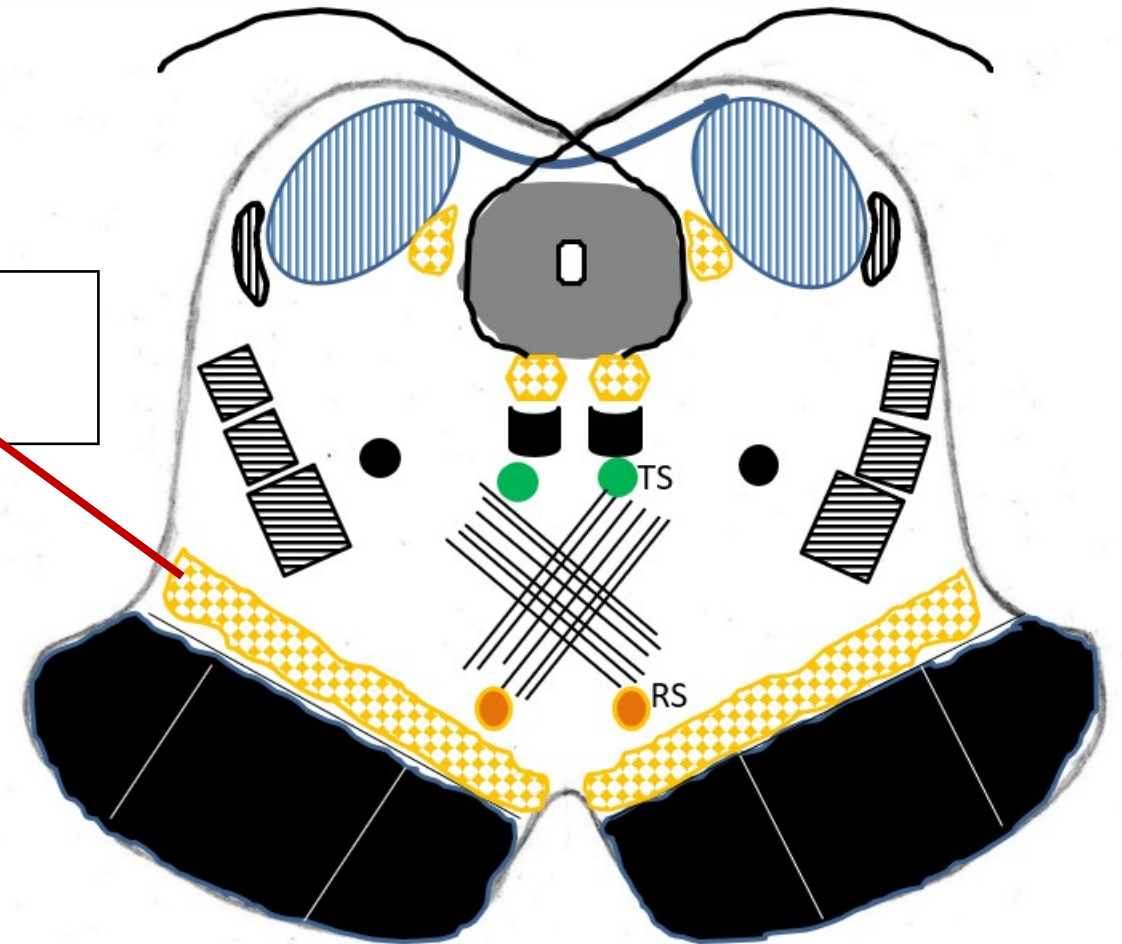
# Internal structure of midbrain

## 2. Substantia nigra:

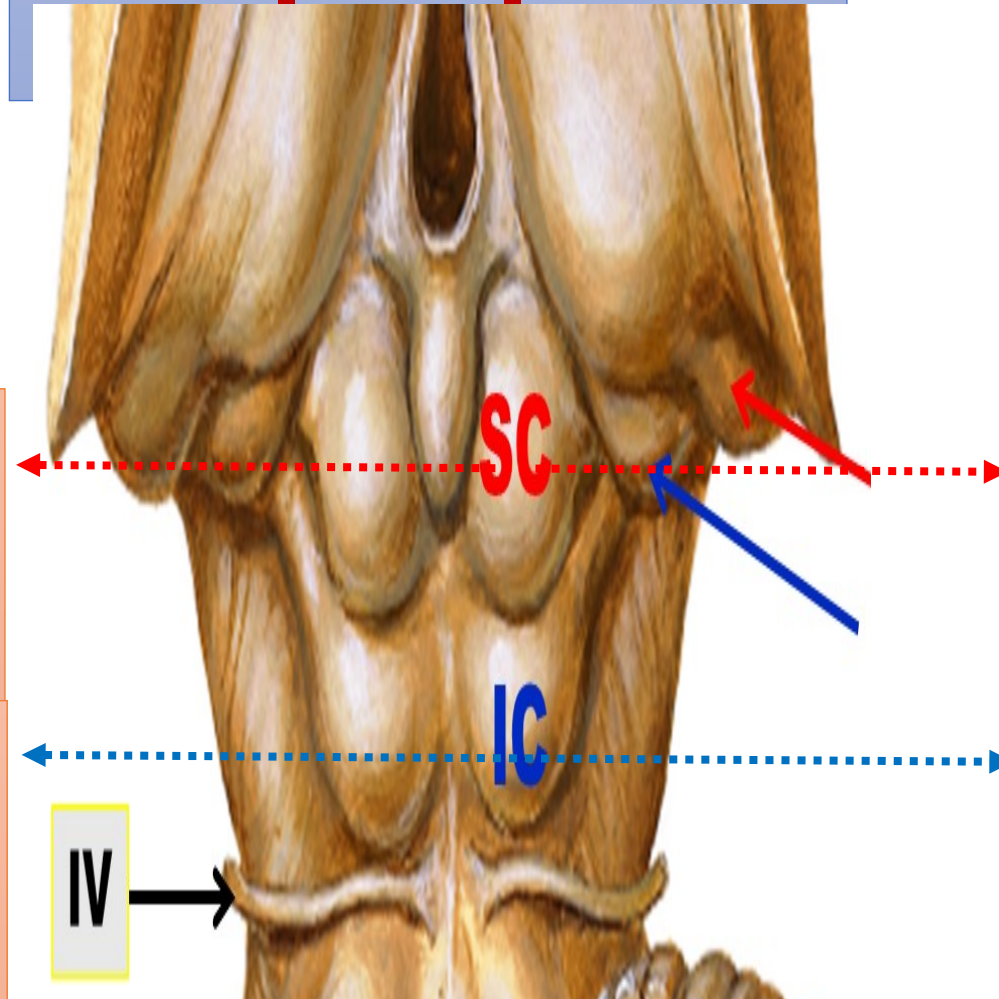
A pigmented sheet of grey matter between the crus cerebri and tegmentum.

- It is formed of medium-sized multipolar neurons containing **melanin pigment**.
- Their lesion leads to **Parkinsonism**.

**Substantia nigra**



# Midbrain



**Upper level at  
the level of  
superior  
colliculus**

**Lower level at  
the level of  
inferior  
colliculus**

# Midbrain at superior

## 1- Oculomotor cranial nerve nuclei

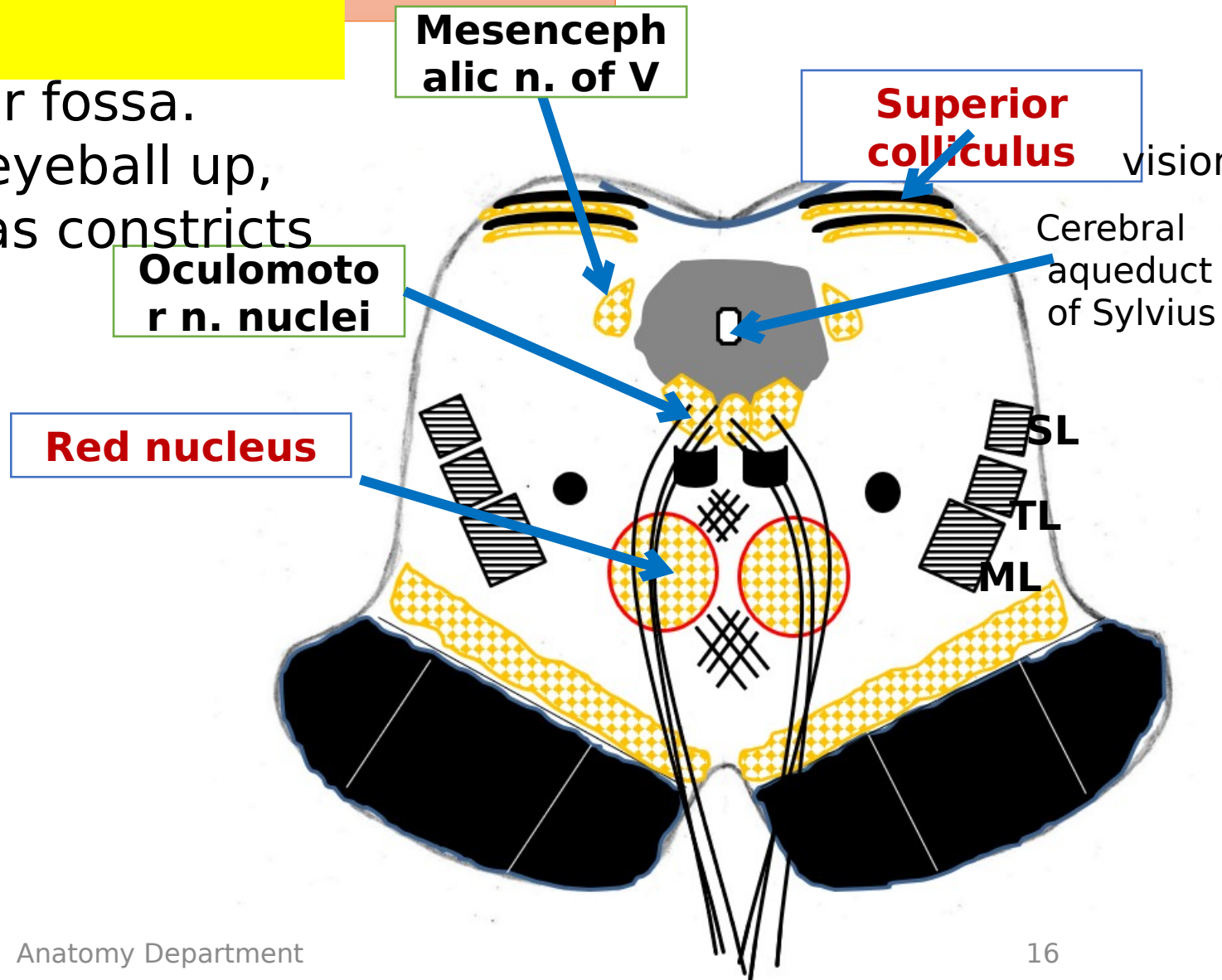
- Traverse red nucleus.
- Exit through interpeduncular fossa.
- Controls muscles that turn eyeball up, down and medially as well as constricts pupil.

## 2- Red nucleus

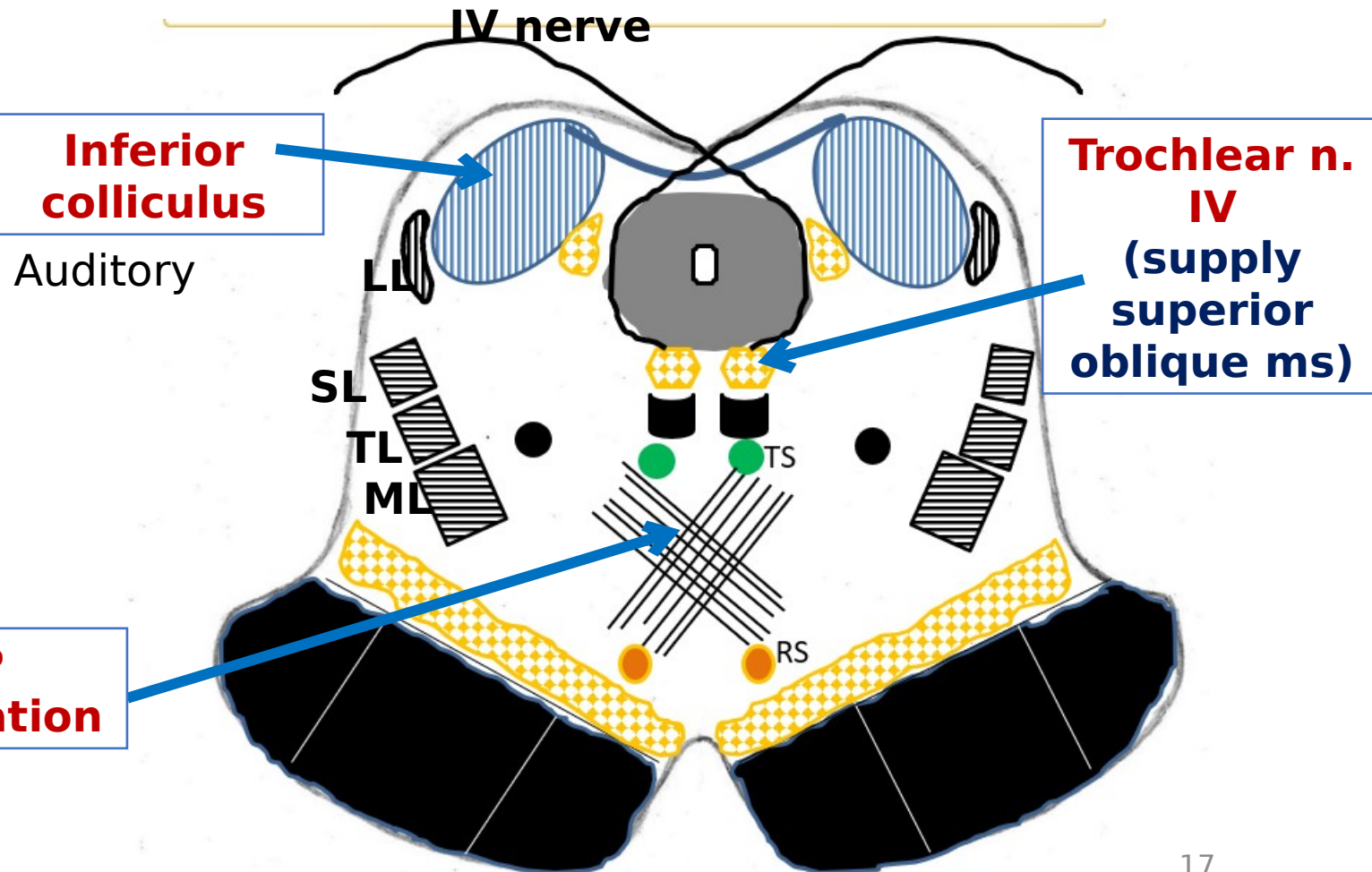
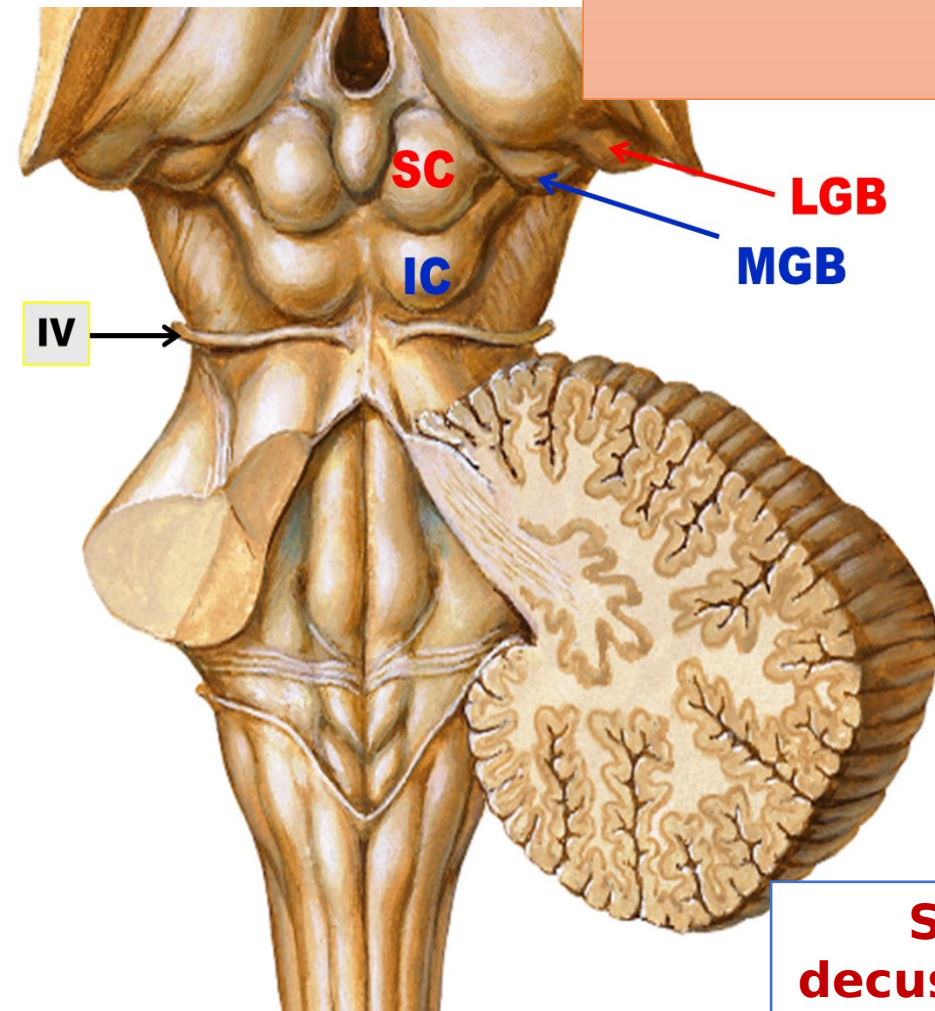
- A large nucleus in the midbrain tegmentum at the level of superior colliculus.
- Appears red due to its **vascularity** and **rich in iron** containing pigment.

## Function:-

**Facilitation of muscle tone**



# Midbrain at inferior colliculus

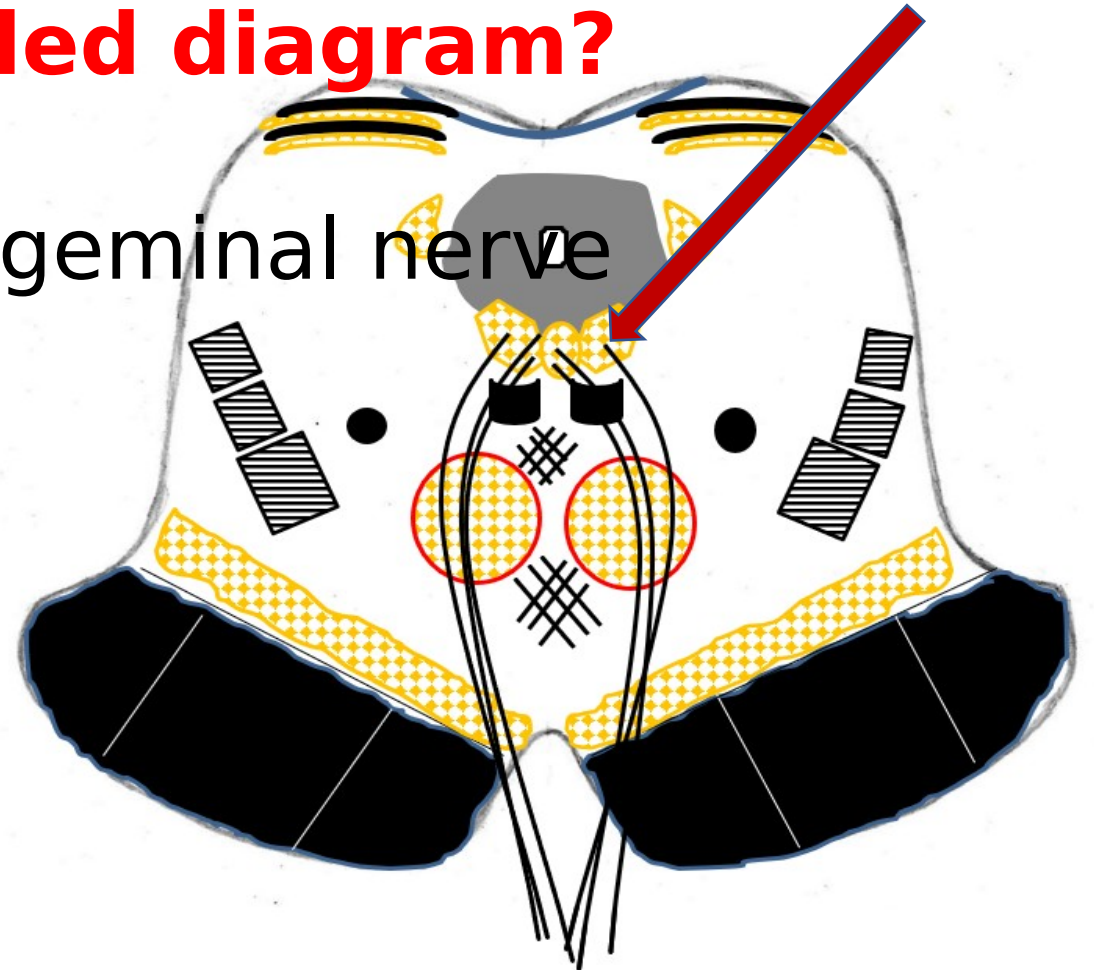


# Lecture Quiz



• Which of the following structure is indicated by the arrow in the provided diagram?

1. Mesencephalic nucleus of trigeminal nerve
2. Oculomotor nerve nuclei
3. Red nucleus
4. Superior colliculus nuclei
5. Substantia nigra nuclei

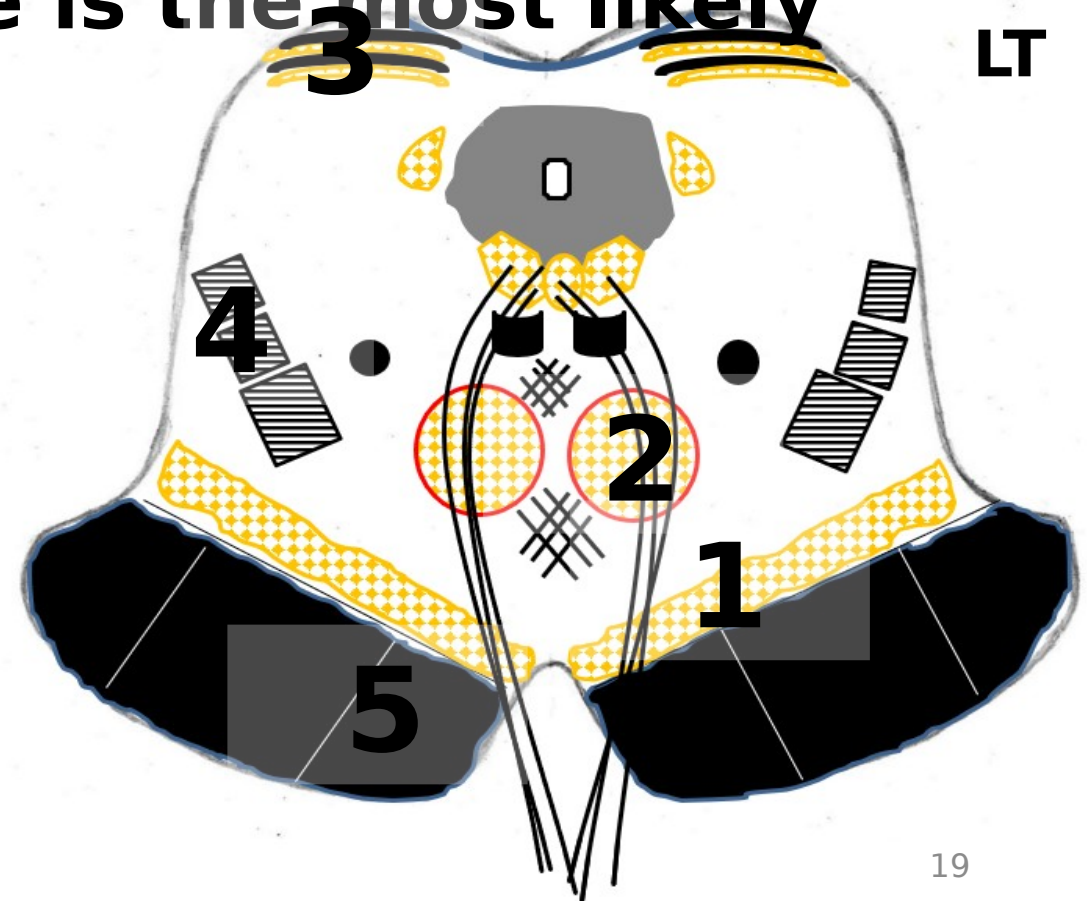


# Quiz



**A patient presents with left sided hemiparesis and a left sided weakness of the left lower face. He also has a dilated right pupil, an abducted and depressed right eye. Where is the most likely location of the lesion?**

- a. 1
- b. 2
- c. 3
- d. 4
- e. 5



Thank you